

# Clinical Characteristics and Molecular Subtyping of *Vibrio vulnificus* Illnesses, Israel

Ronit Zaidenstein, Chantal Sadik, Larisa Lerner, Lea Valinsky June Kopelowitz, Ruth Yishai, Vered Agmon, Michele Parsons, Cheryl Bopp, and Miriam Weinberger

## CME ACTIVITY

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### Learning Objectives

Upon completion of this activity, participants will be able to:

- List the predisposing factors for infections caused by *Vibrio vulnificus* biotypes 1 and 2.
- Identify the differences between infections caused by *V. vulnificus* biotypes 1 and 2 and biotype 3.
- Describe the types of fish associated with *V. vulnificus* biotype 3 infection.
- Describe the mortality associated with *V. vulnificus* biotype 3 infection.
- List the predictors of mortality in *V. vulnificus* biotype 3 infection.

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During 1996–1997, a new *Vibrio vulnificus* biotype 3, which caused severe soft tissue infection after fishbone injury, emerged in Israel. We conducted a follow-up study from 1998 through 2005 to assess changing trends, outcomes, and molecular relatedness of the implicated strains. A total of 132 cases (71% confirmed and 29% suspected) of *V. vulnificus* biotype 3 infection were found. Most infections (95%) were related to percutaneous fish exposure, mainly tilapia (83%) or common carp (13%). Bacteremia, altered immune status, and history of ischemic heart disease were identified as independent risk factors for death, which

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reached a prevalence of 7.6%. Pulsed-field gel electrophoresis patterns of strains from 1998 through 2005 and from 1996 through 1997 showed a high degree of homogeneity and were distinct from those of *V. vulnificus* biotype 1. Infections caused by *V. vulnificus* biotype 3 continue to affect the public's health in Israel.

*Vibrio vulnificus*, a gram-negative bacterium of the family *Vibrionaceae*, is a worldwide inhabitant of salt water (1–3). *V. vulnificus* biotypes 1 and 2 are capable of causing severe human infection, including necrotizing fasciitis and septicemia; the death rate is substantial (4–6). Persons with chronic liver disease, particularly liver cirrhosis, are more prone to developing infection and at greatest risk for an adverse outcome (7,8). Other predisposing factors are iron overload and hemochromatosis and immunosuppression caused by steroid treatment, malignancy, HIV infection, renal failure, and organ transplantation (1,9,10).

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### Article Title

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### CME Questions

1. Which of the following is least likely to be a predisposing factor for infections caused by *Vibrio vulnificus* biotypes 1 and 2?

- A. Anemia
- B. Organ transplantation
- C. HIV infection
- D. Chronic liver disease

2. Illness caused by *V. vulnificus* biotype 3 is best distinguished from that caused by biotypes 1 and 2 by which of the following?

- A. Method of transmission
- B. Genetic features
- C. Geographic distribution
- D. All of the above

3. Which of the following is the primary fish involved in *V. vulnificus* biotype 3 infection?

- A. Gray mullet
- B. Tilapia
- C. Salmon
- D. Sea bass

4. Which of the following best describes the mortality associated with *V. vulnificus* biotype 3 infection as reported in Israel?

- A. 1.0%
- B. 2.3%
- C. 5.2%
- D. 7.5%

5. Which of the following is least likely to be an independent predictor of mortality for *V. vulnificus* biotype 3 infection?

- A. Bacteremia
- B. Ischemic heart disease
- C. Sex
- D. Altered immune status

### Activity Evaluation

1. The activity supported the learning objectives.				
Strongly Disagree				Strongly Agree
1	2	3	4	5
2. The material was organized clearly for learning to occur.				
Strongly Disagree				Strongly Agree
1	2	3	4	5
3. The content learned from this activity will impact my practice.				
Strongly Disagree				Strongly Agree
1	2	3	4	5
4. The activity was presented objectively and free of commercial bias.				
Strongly Disagree				Strongly Agree
1	2	3	4	5

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